



News

AEROSPACE EDUCATION

Inspiring Students to Excel



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"Exploring New Worlds Together"

NCASE 2006

National Conference on Aviation
and Space Education

Plans are underway for the 2006 National Conference on Aviation and Space Education (NCASE). The vision statement that encompasses the plans for this conference is "to bring educators together with leaders of aviation and space agencies, associations and industry groups to enhance the educational experience for America's youth." Attendees will gain access to aerospace education resources, participate in hands-on workshops and seminars, meet industry representatives and share techniques to implement federal and state educational requirements.

The 2006 NCASE conference will be one of the best ever. CAP is planning the event in concert with representatives from many professional organizations, such as the Aerospace Education Foundation/

Air Force Association, U.S. Department of Education, National Coalition of Aviation Education, Federal Aviation Administration, Challenger Center, Wolf Aviation Fund, National Air and Space Museum, VA Department of Aviation and the American Institute of Aeronautics and Astronautics. Civil Air Patrol's Aerospace Education is preparing for the three-day conference (Oct. 19-21, 2006) with the theme: "Exploring New Worlds Together." The location for the 2006 conference is the Marriott Crystal Gateway near historic Washington, D.C. in Arlington, Vir.

Make plans to enjoy the many educational, motivational and inspirational opportunities offered at NCASE 2006. Continue checking the NCASE Web site to find out the latest news concerning this world-class event at www.ncase.info.

PARTNERS FOR AEROSPACE EDUCATION: CAP and the Federal Aviation Association



AVSED program manager Dordan shows Girl Scouts her patches.

Recently, the Federal Aviation Administration (FAA) and Civil Air Patrol signed a Memorandum of Understanding to formally establish a working partnership in support of mutual aerospace education efforts. This agreement provides a tremendous opportunity to bring together expertise, experience and resources in support of common goals.

Just as CAP relies on the public spirit of volunteerism, so does FAA's Aviation and Space Education (AVSED) Program. The AVSED Program provides community outreach activities, educational support and career opportunity initiatives. FAA's cadre of volunteer AVSED counselors energize the program under the leadership of regional program managers and a national program manager. The AVSED Program taps into the FAA's workforce who generate student interest in aerospace and provide support to both formal and informal educators.

AVSED support includes:

The AVSED Web site at www.faa.gov/education serves as a resource for educators, students and the general public by providing curriculum, career materials, a calendar of outreach events, summer camp

programs, employment opportunities, partnership information and links to scholarships and grants.

ACE CAMPS are one-week summer aviation and space education programs for middle and high school students. These workshops are designed to provide students with a wide range of aviation and space career exploration experiences. This program reaches 1,500-2,000 middle and high school students annually.

INTERNATIONAL ART CONTEST has a goal of motivating and encouraging young people of Federation Aeronautics International (FAI)-member nations to become more familiar with and participate in aeronautics, engineering and science.

TEACHER WORKSHOP/ASSISTANCE AND CAREER DAYS are supported by AVSED Programs with resource information, expertise and speakers, when personnel are available.

JOB SHADOW DAY (GROUND HOG JOB SHADOW DAY) is a Department of Transportation and Department of Education annual event supported by the AVSED Program. The event is the kickoff for a yearlong national effort that provides stu-



Shadow Day brings students to a control tower for a look.

dents with an up-close look at how skills learned in school are put into action in the workplace.

FAA AVSED PARTNERSHIPS are formally signed collaborations, such as the one with Civil Air Patrol, that support mutual aerospace education goals. The partnerships provide opportunities to the public through educational contests, resources, conferences and other activities.

The collaboration between FAA and CAP will create programs that will strengthen community outreach. The areas of collaboration include: CAP presentations at FAA AVSED counselor and teacher workshops; CAP and FAA linking to each other's Web sites; mutual sharing/disseminating CAP and FAA program information and materials; and the opportunity for presentations at FAA workshops and CAP NCASE Conferences. We are off to a great beginning and look forward to making the partnership blossom well into the future.

To contact a local FAA Aviation and Space Education Program manager, visit: www.faa.gov/education/contact.cfm.



Student shadows FAA volunteer

IN THE AEM SPOTLIGHT ... SHELIA BAUER



Sheila M. Bauer shares her passion for aerospace with future generations.

Shelia M. Bauer, pilot and educator, is the Federal Aviation Administration's (FAA) National Aviation Education Programs manager. She joined the agency in 1990 as the New England Region's Aviation Education Program manager.

Ms. Bauer is a member of numerous educational boards and national round tables. During her tenure at FAA, Bauer instituted a multitude of programs and has taken hundreds of young women under her wings, both literally and figuratively through the years.

Ms. Bauer brought her childhood love of aviation into the classroom during her tenure as an elementary school teacher in Malden Massachusetts from 1970-1975. The leap from education to private industry began in 1978 when Bauer entered Revere Aviation Inc., a full service Fixed Base Operation (F.B.O.), in Massachusetts where she rose to the president's position nine years later. Experiences at F.B.O. led her to logical progression into the world of the Federal Aviation Administration in 1990.

Once employed at FAA, Bauer continued to share her experience, ideas and passion for aviation with the network of organizations, government and academia. During her 15-year term with FAA, Bauer has provided guidance and expertise in developing national programs. Bauer was the content developer of FAA's first aviation education intranet and Internet Web sites in 1997, and she continues to provide oversight to both sites today.

In addition to her leadership responsibilities for FAA's Aviation and Space Education Programs, Bauer co-chaired the agency's public outreach efforts for the Centennial of Flight (COF) in 2003. The FAA's COF initiatives resulted in aviation education provided to more than one million students, educators and the general public.

Bauer spearheaded the development of numerous national partnership agreements between the FAA and national organizations. The most recent partnership agreement was signed between the FAA and Civil Air Patrol on Oct. 12, 2004. Bauer is particularly

proud of the FAA/CAP partnership agreement because of family ties to CAP. She is the daughter of the late Col. Julius "Julie" Goldman. Col. Goldman served many years with Civil Air Patrol. Up until his death in 2000, Col. Goldman held many distinguished CAP positions, regionally and nationally, and he mentored scores of cadets throughout his tenure. For Bauer, the CAP/FAA partnership is a form of carrying on a family tradition of public service with Bauer representing both Goldman and FAA.

Bauer is an active member of local and national aviation and civic associations. She has been awarded numerous regional and national awards for her efforts to promote aerospace. She holds a private pilot license with instrument, single and multi-engine ratings; she flies her Piper Warrior aircraft with her husband Jeff to many regional aviation events. In addition, Bauer holds a BFA degree from Massachusetts College of Art and Salem State Teacher's College. She is a member of many organizations and has received numerous awards, the most recent being the 2004 Secretary of Transportation's Award for Meritorious Achievement for unprecedented, outstanding performance of duties in the promotion of aviation/space education and safety.

Bauer literally has aviation in her blood. She is committed to passing her joy and excitement about the world of aerospace on to generations to come through her professionalism and passion for the career she has chosen. We thank her for choosing to put her enthusiasm and contributions into Civil Air Patrol and the Federal Aviation Administration.

IN THE AEO SPOTLIGHT ... MAJ. KAYE EBELT



Imagination, dedication and love of learning are three terms that describe Kaye Ebel. During Ebel's teaching career she has taught a variety of subjects and grade levels—middle school social studies and language arts as well as first, second and third grades. Her educational interests include other curriculum areas as well. Ebel's determination to teach across the curriculum to her students and direct application and relevance of their instruction are a vital part of her educational agenda. She has developed and written curriculum for Aerospace Challenge, Mission to Mars, World Fair: A Study of Cultures and The Lewis and Clark Expedition Simulation. She has been involved in aerospace for more than a decade. In addition to her work with students in her classroom, she has given numerous presentations on aviation and space to educators and students throughout Montana.

"As teachers, we must see to it that our students develop their skills and gain experience, while also gaining faith in themselves and the others they work with. The students must be made to understand that if they strive they will succeed, and in their individual success will lie the success of their future and ours."

Kaye Ebel

Following a visit to Kennedy Space Center and a trip to Space Camp, Ebel developed an interest in flying. This interest became a need to learn more and led to pursuing a private pilot's license and becoming a certified ground instructor. In 2001, she was selected by the Montana Aeronautics Division as the Aviation Educator of the Year and was selected to represent the University of Montana at Texas A&M and to attend a NASA Mission Geography Course and Advanced Space Camp. While at Space Camp, she became a certified Underwater Astronaut Trainer diver.

During the 2003 National Congress on Space and Aviation Education, Ebel received

the A. Scott Crossfield Teacher of the Year Award for her aerospace leadership. Last summer she spent six weeks working at NASA Glenn Research Center in Cleveland, Ohio. While in Cleveland she took part in several workshops, which included topics on microgravi-

ty and space shuttle gloveboxes, and she participated in a NASA Explorer School program training workshop. She traveled with top NASA educators to Puducah, Ky., and assisted with a NASA Glovebox

workshop for teachers at the Challenger Learning Center.

As a member of Civil Air Patrol, Ebel has held a variety of positions, including Director of Aerospace Education for the Montana Wing. She is also the Missoula Squadron Commander. Kaye holds



Ebel is a certified Underwater Astronaut Trainer diver.

a master rating in the Aerospace Education Specialty Track and has many other CAP ratings. Ebel also works with the Boy Scout and Girl Scout Merit Badge Aviation Camps, as well as Montana Space Camps for teachers and students. Recently, she was appointed YMCA Camp director for the Mission to Mars Space Camps throughout Montana.

Ebel's educational background includes graduation from Cut Bank High School in Cut Bank, Mont.; a bachelor of arts degree in education from the University of Montana, Missoula; and a master's degree in education with an emphasis in computer technology from Lesley College, Cambridge, Mass.

Ebel says her parents instilled in her a love of learning and they encouraged academic creativity. Her love of learning and her parents' influence eventually led her into the field of education, where she has served as a teacher for the past 22 years.

AEO NEWS AND VIEWS



Aerospace Education Foundation Grants

The Aerospace Education Foundation (AEF) recently announced the winners for the spring grant cycle for Aerospace Education Members. The winners are listed at the end of this article.

AEF continues to provide outstanding support to CAP and has now given CAP units and CAP educators over \$130,000 in grants for promoting aerospace education. These grants are reaching thousands of cadets and students for aerospace education. This last AEM grant cycle will reach over 4,000 students.

The summer CAP unit grant cycle just concluded and the results will be posted on the Web site soon. Has your squadron applied for a grant lately? Do you know any AEMs who should apply? This \$250 grant is a wonderful opportunity to receive some financial support to help you promote aerospace education within your squadron or classroom. Apply now and take advantage of this opportunity.

We must continue to show our appreciation to AEF by completing the grant feedback form. It will only take a couple of minutes to complete. If you don't have the form, you can download one from our Web site, or you can copy the form from page 40 or 41 of CAPP 15. This is a required step in the grant process and one we feel is of the utmost importance. AEF's grant program is making a huge difference for CAP's aerospace educa-

tion, and we want to make sure AEF realizes how much we appreciate its outstanding support.

Spring 2005 Educator Grant Winners

Paula Armstrong
Terri Barclay
Karen Cavender
Patricia Corwin
Linda Gauthier
Alan Godman
Brian Kuhn
Beth Leavitt
Linda Mathes
Pam Onederra
Sandy Sanders
Brenda Shafer
Pollina Sonntag
Roxanne Stern
Karetha Times-Marshall
Jean Trusedel
Sandra Urbaniak
Sheila Wallent
Lee Wheeler
Michael Williams

Ark.
Mont.
Kan.
Ill.
La.
Colo.
Ohio
S.C.
Colo.
Utah
Ala.
Ky.
Fla.
Utah
Fla.
Ind.
S.D.
Calif.
Calif.
Fla.

National Aerospace Education Officers School

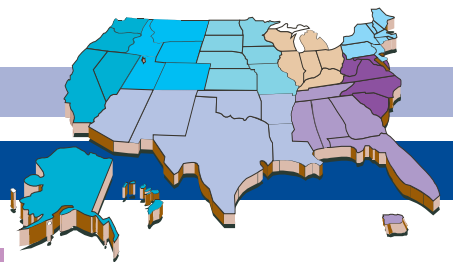
The fourth annual National Aerospace Education Officer (AEO) School will be held at Pensacola Naval Air Station, Fla. from July 21-23, 2005. This school brings together squadron, wing, region and headquarters staff presenting valuable information concerning CAP's aerospace education mission, aerospace programs and the job responsibilities of our aerospace volunteers. This is an ideal opportunity to learn more about AE and how to execute the many duties related to being an AEO or wing DAE.

All applicants who have been accepted should have received notification. If you have applied and haven't heard from us, please e-mail jmontgomery@cap.gov. There are still some openings available. Apply now, using the application form on our Web site. You will find the school to be well worth your time and effort.



St. Regis School students, St. Regis, Mont., try out the NASA glovebox activity which was funded with grant money from the Aerospace Education Foundation.

REGION TO REGION



NORTHEAST REGION

July 23

Fourth Annual Lock Haven Airfest will take place at the Piper Memorial Airport in Lock Haven, Pa. For more information, go to www.lockhavencity.org/Lock_Haven_Airfest.htm.

MIDDLE EAST REGION

Sept. 12-14

The Air Force Association's Air & Space Conference and Technology Exposition will be held in Washington, D.C. There will be an Aerospace Education Foundation workshop on Monday, Sept. 12, from 2:00-3:10 p.m. Go to www.afa.org/events/conference2005.asp to find out more.

GREAT LAKES REGION

July 10

Civil Air Patrol Fly-In will take place from 8 a.m. to 1 p.m. at Sawyer County Airport, Hayward, Wis. Phone 715-634-2801 for more information.

July 25-31

AirVenture 2005 will be held at Wittman Regional in Oshkosh, Wis. For more details on events and exhibits, go to www.airventure.org

Aug. 20-21

Wings of Victory Airshow will take place at Fairfield County Airport in Carroll, Ohio. For more information, go to www.historicalaircraftsquadron.com

Sept. 3-5

Cleveland National Air Show, featuring the U.S. Air Force Thunderbirds, will be held at Burke Lakefront Airport in Cleveland, Ohio. For details, go to www.clevelandairshow.com

SOUTHEAST REGION

July 10-13

2005 Institute for Middle Level Leadership takes place in Gatlinburg, Tenn. For more information, go to www.nmsa.org/development/leadership.htm

**July 10-16 or
July 31-August 6**

Middle school and high school students are invited to attend the Aviation Career Exploration at Embry-Riddle-Daytona Beach, Fla. Find out more about registration and costs at www.erau.edu/db/summeracademy.html

July 15-17

Gulf Coast Hot Air Balloon Festival will take place at the Foley Soccer Complex in Foley, Ala. To find out more, go to www.gulfcoastballoonfestival.com

NORTH CENTRAL REGION

July 9-10

Fargo Air Show will take place at the Fargo Air Museum in Fargo, N.D. Find out more at www.fargoairshow.com

SOUTHWEST REGION

Aug. 19-20

Thirteenth Annual Illinois River Balloonfest 2005 will be held at the Tahlequah Municipal Airport in Tahlequah, Okla.. To find out more, go to www.tah-balloonfest.com

Aug. 26-28

RE/MAX Ballunar Liftoff Festival will be held at NASA/Johnson Space Center in Houston, Texas. Find out more about this one-of-a-kind tribute to human flight at www.ballunarfestival.com

ROCKY MOUNTAIN REGION

July 17-20

2005 Institute for Middle Level Leadership takes place in Breckenridge, Colo. For more information go to www.nmsa.org/delopment/lead-

PACIFIC REGION

July 6-10

37th Annual Arlington Northwest EAA Fly-In and Sport Aviation Convention will take place at Arlington Municipal Airport in Arlington, Wash. Find out more on this event at www.nweaa.org

ITEMS OF INTEREST

The 74th NASAO (National Association of State Aviation Officials) Annual Convention and Trade Show will take place in Des Moines, Iowa. Watch their Web site for further information at www.nasao.org

Nov. 3-5, 2005

The National Middle School Association Annual Conference and Exhibit will be held in Philadelphia, Pa. Watch for more details at www.nmsa.org



The Sally Ride Science Festivals will bring together hundreds of 5th - 8th grade girls for a festive day of science and socializing.

Coming Festivals include:

- Sept. 24 - University of Michigan, Ann Arbor, Mich.
- Oct. 9 - The Delaware Festival at West Chester University, Philadelphia, Pa.
- Oct. 15 - Duke University, Durham, N.C.

For more information go to www.sallyridefestivals.com

CURRICULUM CORNER: The Tachometer

(Aviation and Space Education Outreach Program from the Federal Aviation Administration at www.faa.gov/education)

Objective(s):

Students will learn the function of a tachometer; compare automobile and airplane tachometers; find the ratio of engine speed to propeller speed; and find the engine speed.



Grade Level: Middle School

National Science Standards:

Content Standard E: Science and Technology

- Abilities of technological design

National Mathematics Standards:

1. Number and Operations Standard
 - Compute fluently and make reasonable estimates.
2. Algebra Standard
 - Understand patterns, relations, and functions.
4. Measurement Standard
 - Apply appropriate techniques, tools, and formulas to determine measurements.
6. Problem Solving Standard
 - Build new mathematical knowledge through problem solving.
9. Connections Standard
 - Recognize and apply mathematics in contexts outside of mathematics.

Materials:

Problem sheet and pencils

Background Information:

A tachometer is a device for counting. It is used to show the number of revolutions per minute (RPM) of the aircraft engine. An airplane needs one tachometer for each of its engines. The tachometer on the airplane is equivalent to the odometer on your automobile.

Procedure:

1. Display a tachometer or pictures of tachometers.
2. Compare the tachometer to the automobile odometer. Discuss the similarities of the function of each.
3. Construct tachometer dials from paper plates and attach hand with a brass paper fastener.
4. Practice reading tachometers at various settings.
5. Discuss reasons why automobiles have only one odometer or tachometer, but airplanes have two or more tachometers.
6. Explain: An airplane's engines often run faster than its propellers. For example, on one airplane, the most efficient engine speed is 3,000 RPM, while the most efficient propeller speed is about 1,500 RPM. A set of reduction gears permits the engine to run at 3,000 RPM while the propeller turns at 1,500 RPM. When this happens, the ratio of engine

RPM to propeller RPM is two to one (2:1). Other ratios can range from 4:3 to 3:1.

Example:

If an airplane runs at 3,780 RPM, and the ratio of engine speed to propeller speed is 3:1, what is the speed of the propeller?

Solution:

Since this ratio of engine speed to propeller speed is 3:1, divide 3,780 by 3 to find the propeller speed of 1,260 RPM.

Example:

What is the ratio between an engine speed of 2,440 RPM and a propeller speed of 1,220 RPM?

Solution:

Divide 2,440 by 1,220 to find the ratio of 2:1.



Answers:

- | | |
|--------------|--------------|
| 1. 1,580 RPM | 5. 2:1 |
| 2. 1,360 RPM | 6. 5:3 |
| 3. 2,175 RPM | 7. 1,350 RPM |
| 4. 3,750 RPM | 8. 3,360 RPM |

Find the missing number in each of the following problems:

Engine Speed	Propeller Speed	Ratio of Engine Speed to Propeller Speed
1. 3,160 RPM		2:1
2. 3,400 RPM		5:2
3.	1,450 RPM	3:2
4.	1,250 RPM	3:1
5. 3,150 RPM	1,575 RPM	
6. 2,800 RPM	1,680 RPM	
7. 1,800 RPM		4:3
8.	1,470 RPM	16:7

FLYING HIGH!

(Aviation and Space Education Outreach Program from the Federal Aviation Administration at www.faa.gov/education)

Objective(s):

Students will solve time, speed and distance problems; solve fuel consumption and fuel cost problems; and make comparisons between the Wright Flyer and SR-71.

Grade Level: Middle School
National Mathematics Standards:

1. Numbers and Operations Standard
 - Compute fluently and make reasonable estimates.
6. Problem Solving Standard
 - Solve problems that arise in mathematics and in other contexts.
9. Connections Standard
 - Recognize and apply mathematics in contexts outside of mathematics.

Materials:

Problems worksheet and pencil
(calculator is optional)

Procedure:

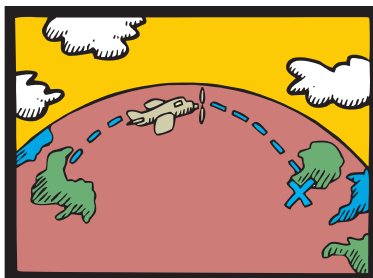
Complete and answer the following problems:

Answers:

1. **440 feet per second**
2. **2,970 miles**
3. **9.9 hours**
4. **12.9 hours**
5. **322.5 gallons**
6. **\$725.63**

"Wright" Answers:

1. **15 feet 2 inches longer**
3. **66,804 pounds heavier**



Name _____

Date _____

1. If a jet travels 300 miles per hour, how many feet per second will it travel? _____

2. Mileage Between Cities

Ketchikan	Juneau	Anchorage	Bethel	Barrow	Fairbanks	Ketchikan
Start	224	505	340	693	440	768

To use the chart: Start at Ketchikan. The distance to the first stop (Juneau) is 224 miles. The distance between Juneau and Anchorage is 505 miles. The distance between Anchorage and Bethel is 340 miles and so on until you return to Ketchikan from Fairbanks.

If you flew a route that took you from Ketchikan to Juneau, Anchorage, Bethel, Barrow, Fairbanks and back to Ketchikan, what would be the total distance traveled?

3. If your jet flew at a speed of 300 miles per hour, how long would it take you to fly the entire route? (Round your answer to the nearest tenth).
4. If you allowed an additional 15 minutes for each takeoff and 15 minutes for each landing, how much time would be required to complete the flight plan?
5. Your plane uses an average of 25 gallons of fuel per hour of flying time (including takeoffs and landings) What is the total amount of fuel in gallons required to complete the trip?
6. If fuel costs \$2.25 per gallon, what is the total cost of fuel?

The Wright Flyer was the first heavier-than-air powered airplane to fly successfully. It flew for 12 seconds, covering 120 feet. The Flyer was 21 feet, 1 inch long, weighted 746 pounds and had a wingspan of 40 feet, 4 inches. The SR-71 Blackbird was a high-altitude, high-speed military reconnaissance plane. It set a work speed record in 1976, flying 2,193.7 miles per hour at 85,000 feet. The SR-71 was 107 feet, 4 inches long, weighed 67,550 pounds (without fuel), and had a wingspan of 55 feet, 6 inches. Compare the length, weight and wingspan of the two planes and answer the following questions:

1. What is the difference in the wingspan?
2. What is the weight difference?